

City of Alexandria Storm Sewer Capacity Analysis

Task Order 2D – Heavy Cleaning & CCTV (N. Beauregard St)

Storm Pipe Segment: 001316STMP

PREPARED FOR: CH2M HILL

PREPARED BY: Baker

DATE: August 7, 2012

Field Work Summary (July 6, 2012)

VPS performed heavy cleaning operations within storm pipe 001316STMP, the 57-inch diameter gravity main located on North Beauregard Street near the intersection with Larchmont Avenue. This segment is 130 feet long and extends from upstream manhole 000391SMH to downstream manhole 000392SMH. Large pieces of concrete and metal debris were removed by VPS personnel operating inside the pipe with a confined space permit. A post-cleaning CCTV inspection followed to inspect the pipe for defects. See Appendix A for the condition report from VPS.

VPS had previously attempted an inspection on this line on February 24, 2012. The inspection of storm pipe 001316STMP was abandoned because the CCTV camera rig was unable to pass the large debris. See Appendix B for images of the debris inside the pipe.

During a separate part of this Task Order, VPS performed manhole inspections at the upstream and downstream structures of this line (000391SMH and 000392SMH). The field reports are included as Appendix C.

Condition Assessment Summary

VPS inspected 130 linear feet of 57-inch diameter tar-lined corrugated metal pipe. No significant structural defects were observed in the pipe; small amounts of sand and gravel were observed embedded in the tar lining.

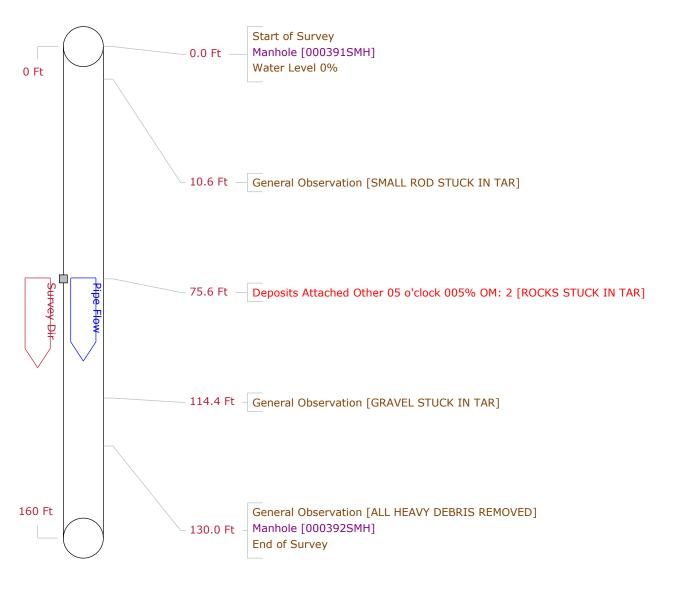
At the downstream end of the subject line (just beyond manhole 000392SMH) there is a 6-inch diameter pipe apparatus, believed to be abandoned, affixed to the bottom of the storm pipe. The original function of the 6-inch pipe is not known. The included images (Appendix D) display the location and orientation of the pipe. VPS reported that the pipe is fused to the bottom of the storm sewer pipe with cement mortar and was unable to separate the two pipes for removal. Regular maintenance and cleaning is essential to eliminate the potential of debris accumulation at this location.

APPENDIX A

VIDEO PIPE SERVICES CCTV REPORT 000391SMH TO 000392SMH JULY 6, 2012

Pipe Graphic Report of PSR 000391SMH X for CH2M HILL

Setup 1 Surveyor SMU	Certificate #	U-809-9223	System Owner CITY OF	ALEXANDRIA
Drainage ALEXANDRIA Survey Cu	ustomer CH2M HILL		•	
P/O # Date 2	2012/07/06 Time 7:48	Street N. BEA	UREGARD ST.	
City ALEXANDRIA	Further location detail	s N. BEAUREGARD S	ST. & KING ST.	
Start 000391SMH	Rim to invert 13.50	Grade to invert	Rim to grade	Ft
Finish 000392SMH	Rim to invert 14.00	Grade to invert	Rim to grade	Ft
Use Stormwater	Direction Downstream	Flow control N	lot Controlled Media No	CH2M-7-6
Shape Circular	Height 57 Width	ins Preclear	n H Year Clea	aned 2012/07/06
Material Corrugated Metal Pipe	Joint length 10.0	Ft Total length	160.0 Ft Length Survey	/ed 130.00
Lining	Year laid	Year rehabilitated	Weather Dry	
Purpose Maintenance Related		Cat		
Additional info HEAVY CLEANED	FOR DEBRIS	:	Structural O&M	Constructional
Location Light Highway			Miscellaneous Hydraulic	
Project BEAUREGARD ST. ALEXAN	NDRIA		Work Order	
Northing	Easting	Elevati	on	
Coordinate System		GPS	Accuracy	



CCTV Surveys List for CH2M HILL

Number of surveys in this list is 1 as of Monday, July 23, 2012 Unit of measure: ft

Set	ıp Date	Street	Start MH	Finish MH	Dir	Size inch	Pre Clean	Media Number	Scheduled Length	Surveyed Length
1	7/6/2012	N. BEAUREGARD ST.	000391SMH	000392SMH	D	57	Н	CH2M-7-6	160.0	130.0
						7	Total Scheduled Length 16		160.0	1

Total Length Surveyed

130.0

APPENDIX B

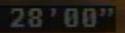
SNAPSHOTS FROM CCTV INSPECTION ON FEBRUARY 24, 2012 IMAGES OF HEAVY DEBRIS INSIDE PIPE

N BEAURAGARD ST From: 2 To: 3

18'05"

02.13.2012

N BEAURAGARD ST From: 2 To: 3



02.13.2012

N BEAURAGARD ST From: 2 To: 3

APPENDIX C

MANHOLE INSPECTION REPORTS FOR 000391SMH AND 000392SMH

Alexandria Ma	anhole and Lamping I	nspection Form	Basin No. FOUR	MILE RUN		Manhole N	000391SMH	
Inspection Informat		Manhole Information		✓ Con	nplete	Quick	Incomplete	Returned
Insp Date/Time	3/12/2012	Structure Type	Manhole Standard	L		Setting Infor		
Crew	Truck 1	Coating/Liner Type	None - No Coating/Lining		Surface	_	Asphalt	
Crew Affiliation	Field1	Address 3400	N BEAUREGARD ST		affic Volu		Medium/Fair	
Permit No	V08093003	City, State, Zip	Alexandria,VA 00000		affic Type		3 - 4 Lane	
Insp Purpose	Routine assessment/asse	Location Code	Light Highway Rural Street		ather	•	Dry	
Inspection Type	Surface Inspection	X 11879173.8	Y 6992415.294		ound Co	nd	Dry	
Why not Inspected		Elevation	140.79		Juna Ooi	ii d	Diy	
Owner Information Project No.		Grade (0, + , -)		Manh	nole-Uppe	er	0	1 2 3 4
Project No. 2		Flow Type				eterioration w	videspread 🗹	
Project Name		DS pipe length(ft)		Monk		ting/lining de	eterioration 🗹	
Map No		Depth to MH Invert(f			nole-Lowe rrosion de	er eterioration w	videspread	
Use of Sewer	Stormwater	Pre-cleaning	No Pre-Cleaning			ting/lining de		
	stment Ring / Cover Ir	sert	Frame cont.			Char	nber (Wall) c	ont
No Cover	✓ No Cover Insert	Frame	0 1 2	3 4	Chambe			1 2 3 4
No Cover Gasket		Ding	ken / deteriorated				Cracked	
		001100	ed, pitted,spalled 🗸 📗 🔛 s or Broken Bolts 🗸 📗	HHI			pitted,spalled Iortar missing	
Cover Type	Solid	IVIISSIII G DOIL	Offset 🗸		Br		ed or missing	
Cover material	Cast Iron		Missing			Ro	oots Intrusion	
		Frame Base Sea	al 0 1 2 ded / deteriorated	3 4			Grease 🗸 Jtility conduit	HHHH
0 51 (6)			ed, pitted,spalled				Offset or Seal	
Cover Diam(ft)	24		Roots Intrusion	HHI		1.26.1	Collapse 🗸	
Cover Width(ft)	(') 0.05		I/I evidence ✓			Lift hole p	plugs missing 🗸	
Cover Thickness	` '		ey (Shaft) / Grade Rir	ng			Bench	
No of vent holes		Re	educer (Cone, Slab)				Steps	
Avg vent hole dia			Chamber (Wall)			Ch	nannel (Inver	ct)
Adj ring height(in Cover bear surf	· 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	No Chimney (01.13	No E	Bench	✓ No Ste	eps
Ponding depth(ft		No Chimney (Shaft) No Reducer (Cone	e, SIAD)	No (Channel		ommon MH Partition
Tributary area(so	·		iterial Diam in Width in D	Denth ft				
Tributary area(so	1")	IVIC	iteriai Diamini Widinin L	Эерин н				
Cover	0 1 2 3	4			Surch	arge Depth	h(ft)	I
	or Displaced 🗹 🗌 📗	Chimney 5	[6	6.8			` '	
Cracked /	deteriorated 🗸 📗 📗				Bench	material	Precast Co	oncrete
Corroded.	Fit in Frame 🗹 📗 📗 pitted,spalled		1 11 11		Chann	el material	Precast Co	oncrete
	Surface wear 🔽 🔲 🔲	Chamber 5	4	4.5	Bench	ioi inatona	0	1 2 3 4
Missing Bolts or	Broken Bolts 🗹 🗌 📗	Chimney (Shaft	0 1 2	3 4	Belicii		Cracked 🗸	
			Previous rehab				pitted,spalled	
		Corred	Cracked	HHI	Br		lortar missing determissing determissing determined determined	HHHH
		Corrod	Mortar missing				oots Intrusion	
		Bricks disp	placed or missing 🗹 🗌				Grease 🗸	
			Roots Intrusion	HHI		Deb	ris/deposition I/I evidence	HHHH
			I/I evidence		Channe	ı	0	1 2 3 4
						0	Cracked 🗸	
							pitted,spalled Iortar missing	HHHH
					Br		ed or missing	
						Ro	oots Intrusion Grease	HHHH
Frame	e and Frame Seal					Deb	Grease ris/deposition	
☐ No Frame	☐ No Frame Base S	Seal			Pipe	segment cra	icked, spalled 🔽	
						H	Hydraulic flow 1/I evidence	HHHH
Frame material	3						WI GAIGGIIGE	
Frame bearing su	urf diam(in) 24							
Frame bearing su	ırf width(in)							
Frame bearing su	urf dwell(in) 1							
Frame offset dist((in)							
Frame depth(in)	8							
Frame seal mater	rial 39							
Clear opening dia	am(in) 22							
Clear opening wid								



FOUR O00392SMH In Out Storm 13.7 Circular Corrugated Metal 57							
FOUR MILE RUN Storm Severity O 1 2 3 4 I/I evidence Mortar, "boot", or other seal Pipe cracked Roots Intrusion New N/A Basin Connecting MH Flow Direction FOUR MILE RUN O 1 2 3 4 I/I evidence I/I evide							
FOUR MILE RUN Storm Severity O 1 2 3 4 I/I evidence Mortar, "boot", or other seal Pipe cracked Roots Intrusion New N/A Basin Connecting MH Flow Direction FOUR MILE RUN O 1 2 3 4 I/I evidence I/I evide	ı						
Pipe Seal Condition Severity 0 1 2 3 4 I/I evidence Mortar, "boot", or other seal Pipe cracked Roots Intrusion New N/A Basin Connecting MH Flow Direction Pipe Type FOUR MILE RUN Metal Metal Metal Metal Metal Motar In Drop Ex Drop Depth Shape Matl Dia FOUR MILE RUN Metal Metal Metal Metal		Tow Direction Pipe Type	In Drop Ex Drop	Depth	Shape	Matl	Dia
O 1 2 3 4 I/I evidence Mortar, "boot", or other seal		n ☐ Out Storm		13.7	Circular		54
I/I evidence Mortar, "boot", or other seal Pipe cracked Roots Intrusion New N/A Basin Connecting MH Flow Direction Pipe Type FOUR MILE RUN Out Storm In Prop Ex Drop Depth Shape Matl Dia Torrugated Metal Torrugated Metal	Pipe Seal Condition	Severity					
Mortar, "boot", or other seal Pipe cracked Roots Intrusion New N/A Basin Connecting MH Flow Direction Pipe Type In Drop Ex Drop Depth Shape Matl Dia FOUR MILE RUN 000392SMH In Vout Storm 13.7 Circular Corrugated Metal		0 1 2 3 4					
Pipe cracked Roots Intrusion New N/A Basin Connecting MH Flow Direction Pipe Type In Drop Ex Drop Depth Shape Matl Dia FOUR MILE RUN 000392SMH In Vision	I/I evidence						
Roots Intrusion New N/A Basin Connecting MH Flow Direction Pipe Type In Drop Ex Drop Depth Shape Matl Dia FOUR MILE RUN Out Storm 13.7 Circular Corrugated Metal	Mortar, "boot", or other seal						
New N/A Basin Connecting MH Flow Direction Pipe Type In Drop Ex Drop Depth Shape Matl Dia FOUR MILE RUN 000392SMH In Four Out Storm 13.7 Circular Corrugated Metal 57	Pipe cracked						
FOUR MILE RUN 000392SMH In Out Storm I 13.7 Circular Corrugated 57	Roots Intrusion						
MILE RUN Metal	New N/A Basin Connecting MH	low Direction Pipe Type	In Drop Ex Drop	Depth	Shape	Matl	Dia
		☐ In ✓ Out Storm		13.7	Circular		57
Pipe Seal Condition Severity	Pipe Seal Condition	Severity					
0 1 2 3 4	-	0 1 2 3 4					
I/I evidence	I/I evidence						
Mortar, "boot", or other seal	Mortar, "boot", or other seal						
Pipe cracked	Pipe cracked						
Roots Intrusion	Roots Intrusion						



Basin No. FOUR MILE RUN

Manhole N 000391SMH

Photos

Photo Name

Description

PhotoType

Old Photo Name

000391SMH_Cover_20120312_6111.JPG

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000391SMH_Frame_20120312_6112.JPG

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000391SMH_Chamber_20120312_6113.JPG

Chamber

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000391SMH_General_20120312_6114.JPG

SIZE OF INCOMING PIPE FROM 000185ND

General

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INCOMING PIPE FROM 000185ND

General

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000391SMH_General_20120312_6116.JPG

INCOMING PIPE FROM 000185ND

General

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INCOMING PIPE FROM 000185ND

General

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Basin No. FOUR MILE RUN

Manhole N 000391SMH

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INCOMING PIPE FROM 000185ND

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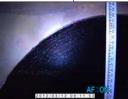


000391SMH_General_20120312_6119.JPG

SIZE OF OUTGOING PIPE TO 000392SMH

General

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000391SMH_General_20120312_6120.JPG

OUTGOING PIPE TO 000392SMH

General

0912051J.JPG



000391SMH_General_20120312_6121.JPG

OUTGOING PIPE TO 000392SMH

General

0912111J.JPG

000391SMH_General_20120312_6122.JPG

OUTGOING PIPE TO 000392SMH

General

0912231J.JPG

000391SMH_General_20120312_6123.JPG

OUTGOING PIPE TO 000392SMH

General

0912301J.JPG



		nspectio	_		OK WILE KU	iviannole iv	
Inspection Informati		Manhole	Information		✓ Co	omplete Quick	Incomplete Returned
liisp Date/Tille	3/9/2012	Structure	Туре	Manhole Standard	<u> </u>		
Crew	Truck 1	Coating/	Liner Type	None - No Coating/Linin	a	spection Setting Info	
Crew Affiliation	Field1	Address	4700	KING ST		IH Surface Type	Asphalt
Permit No	V08093003	City, Sta	te, Zip	Alexandria,VA 00000		raffic Volume	Low/Good
Insp Purpose	Routine assessment/asse	Location	Code	Light Highway Rural Str	eet	raffic Type	3 - 4 Lane
Inspection Type	Surface Inspection	Х		Υ		Veather	Dry
Why not Inspected		Elevation	1		- (-	Fround Cond	Dry
Owner Information		Grade (0	, + , -)	/			
Project No.		Flow Typ				nhole-Upper Corrosion deterioration v	widespread V
Project No. 2		, ,	length(ft)			Coating/lining de	
Project Name			MH Invert(ft	14.5		nhole-Lower	0 1 2 3 4
Map No		Pre-clea	ning	No Pre-Cleaning		Corrosion deterioration v Coating/lining de	
Use of Sewer	Stormwater			-	ı		
	tment Ring / Cover In			Frame cont.			mber (Wall) cont.
No Cover	✓ No Cover Insert		i me Cracked / broke	en / deteriorated 🗸 🗌	2 3 4	Chamber	0 1 2 3 4 Cracked
✓ No Cover Gasket	No Cover Adjustment	Ring		ed, pitted,spalled		Corroded,	pitted,spalled
Cover Type	Solid			or Broken Bolts		N	Nortar missing 🗸 🗌 🔲 🔲
Cover material	Cast Iron			Offset 🗸 🔛	$\dashv H H$	Bricks displac	
oovor matorial	odot non	Fra	me Base Sea	• — —	2 3 4	K	oots Intrusion 🗸 📗 📗 📗
				ed / deteriorated 🔲 🗸		l l	Utility conduit 🗹 🗌 📗 📗
Cover Diam(ft)	24		Corrode	ed, pitted,spalled		Joint (Offset or Seal
Cover Width(ft)				Roots Intrusion I/I evidence	$\dashv \vdash \vdash \vdash$	Lift hole	Collapse 🗸 🔲 🔲 📗
Cover Thickness	(in) 3.25		Chimn	ey (Shaft) / Grade I	Ding	2	I/I evidence
No of vent holes	2						Bench
Avg vent hole dia			Re	ducer (Cone, Slab)			Steps
Adj ring height(in)			No Chimney (S	Chamber (Wall) Shaft) Seal No Grade Rin	a	CI	nannel (Invert)
Cover bear surf d	·		No Chimney (S	_		✓ No Bench	✓ No Steps
Ponding depth(ft)			INO CHIMINEY (C	MO Reducer (oone, olab)	✓ No Channel	✓ No Common MH Partition
Tributary area(sq			Mat	terial Diam in Width ir	Denth ft		
Tributary area(54	ii)		IVIC	tenai Diam'in Widin'ii	г Борити		
Cover	0 1 2 3	4				Surcharge Dept	h(ft)
	or Displaced 🗹 🔲 🔲		imney 5		4.2	Outcharge Dept	n(it)
	deteriorated						
	Fit in Frame	HII			11 1		
S	Surface wear 🔽 🗌 📗	Cr	amber 5		10.3		
Missing Bolts or E	Broken Bolts 🗸 🗌 🔲	Ch	imney (Shaft)	0 1	2 3 4		
			, ,	Previous rehab			
			Corrodo	Cracked			
			Corrode	Cracked ed, pitted,spalled			
				Cracked			
				Cracked			
				Cracked			
				Cracked			
				Cracked			
				Cracked			
				Cracked			
Frame	a and Frame Seal			Cracked			
Frame No Frame	e and Frame Seal	eal		Cracked			
	_	eal		Cracked			
No Frame	☐ No Frame Base S	eal		Cracked			
No Frame Frame material Frame bearing sur	No Frame Base S 3 rf diam(in) 24	eal		Cracked			
No Frame Frame material Frame bearing sur Frame bearing sur	No Frame Base S 3 rf diam(in) 24 rf width(in)	eal		Cracked			
No Frame Frame material Frame bearing sur Frame bearing sur	No Frame Base S 3 rf diam(in) 24 rf width(in) 1	eal		Cracked			
No Frame Frame material Frame bearing sur Frame bearing sur Frame bearing sur Frame offset dist(i	No Frame Base S 3 rf diam(in) 24 rf width(in) 1 rf dwell(in) 1	eal		Cracked			
No Frame Frame material Frame bearing sur Frame bearing sur Frame bearing sur Frame offset dist(i Frame depth(in)	No Frame Base S 3 24 rf diam(in) rf dwell(in) ff dwell(in) 8	eal		Cracked			
No Frame Frame material Frame bearing sur Frame bearing sur Frame bearing sur Frame offset dist(i	No Frame Base S 3	eal		Cracked			



Basin No.	FOUR MILE RUN	Manhole N	000392SMH

Ν		-00	/ el	COto	
N	(O)	(+13-		Ketci	• 1

								ı
New N/A Basin Connecting MH FI	ow Direction	Pipe Type	In Drop E	x Drop	Depth	Shape	Matl	Dia
FOUR 000391SMH MILE RUN	In Out	Storm			13.6	Circular	Corrugated Metal	57
Pipe Seal Condition	Severit	xy .						
	0 1 2	3 4						
I/I evidence								
Mortar, "boot", or other seal								
Pipe cracked								
Roots Intrusion								
New N/A Basin Connecting MH FI	ow Direction	Pipe Type	In Drop E	x Drop	Depth	Shape	Matl	Dia
FOUR 000393SMH MILE RUN	In 🗸 Out	Storm			14.5	Circular	Corrugated Metal	60
Pipe Seal Condition	Severit	:y						
	0 1 2	3 4						
I/I evidence								
Mortar, "boot", or other seal								
Pipe cracked								
Roots Intrusion								
New N/A Basin Connecting MH FI	ow Direction	Pipe Type	In Drop E	x Drop	Depth	Shape	Matl	Dia
FOUR 002837ND MILE RUN	In Out	Storm			11.3	Circular	Reinforced Concrete	18
Pipe Seal Condition	Severit	ty	Lamping Observations					
	0 1 2	3 4	SCREAM Defect Code					Distance
I/I evidence				•	neral Rema			
Mortar, "boot", or other seal			Description: D	oid not at	tempt to fir	d origin of line.		
Pipe cracked								
Roots Intrusion								



Basin No. FOUR MILE RUN

Manhole N 000392SMH

Photos

Photo Name Description 000392SMH_Topside_20120309_5970.JPG

PhotoType

Old Photo Name

Topside

0936111J.JPG



000392SMH_Cover_20120309_5971.JPG

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000392SMH_Frame_20120309_5972.JPG

Frame

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000392SMH_Chimney-Shaft_20120309_5973.J

Chimney-Shaft

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000392SMH_Chimney-Shaft_20120309_5974.J

Chimney-Shaft

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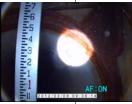
000392SMH_General_20120309_5975.JPG

SIZE OF INCOMING PIPE FROM 002837ND

General

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000392SMH_General_20120309_5976.JPG

INCOMING PIPE FROM 002837ND

General

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Page 3 of 5



Basin No.

FOUR MILE RUN

Manhole N 000392SMH

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INCOMING PIPE FROM 002837ND

General

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AF-GN HOTENOTICE ACTIONS 11

General

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000392SMH_Chamber_20120309_5979.JPG

Chamber

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000392SMH_General_20120309_5980.JPG

SIZE OF INCOMING PIPE FROM 000391SMH

General

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000392SMH_General_20120309_5981.JPG

INCOMING PIPE FROM 000391SMH

General

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000392SMH_General_20120309_5982.JPG

INCOMING PIPE FROM 000391SMH

General

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INCOMING PIPE FROM 000391SMH

General

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000392SMH_General_20120309_5984.JPG

SIZE OF OUTGOING PIPE TO 000393SMH

General

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Basin No. FOUR MILE RUN

Manhole N 000392SMH

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000392SMH_General_20120309_5986.JPG

000392SMH_General_20120309_5985.JPG

OUTGOING PIPE TO 000393SMH

OUTGOING PIPE TO 000393SMH

General

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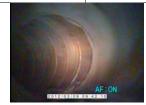


000392SMH_General_20120309_5987.JPG

OUTGOING PIPE TO 000393SMH

General

0942101J.JPG



APPENDIX D

IMAGES OF 6-INCH PIPE APPARATUS INSIDE 57-INCH STORM MAIN



